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SUMMARY OF NATIONAL PAPER*

Basic Features

1. The Danish Government warmly welcomes the holding of the UNCSTD. The conference should aim at concerted efforts to harness the potentials of science and technology for the social and economic benefit of the developing countries. The building up or strengthening of the scientific and technological infrastructures of the developing countries, with a view to diminishing their present almost unilateral dependence on the industrialized world, is an important tool in this respect.

2. Thanks to the industrialization, gaining momentum from the 1870s and developing at an accelerated speed after the Second World War, Denmark ranks today, in spite of a general lack of raw materials, among the richest countries in the world, measured by per capita income. This is due to several factors among which the high level of general enlightenment and skill seems especially important. It is characteristic of Denmark that this development has been consistent with and may be even stimulated by the structure of Danish industry, i.e. many and relatively small enterprises.

3. During the last 15-20 years public research has gained increased importance as a promoting as well as an adjusting factor in the general social development. Some of the main reasons are the emergence of environmental problems of a new character and scale and the extremely rapid technological development within special fields.

* The designations employed, the presentation of material and the views expressed in this paper are those of the Government of Denmark and do not necessarily reflect the practices and views of the Secretariat of the United Nations in any of these respects.

4. For the year 1975, total private and public expenditure on research has been estimated at $US 419 million, corresponding to 1.2 per cent of GNP. About 40 per cent of the amount is spent by the private sector.

5. In private firms research and development are almost exclusively financed by own funds. Eighty-four per cent of these activities are dedicated to experimental development, 15 per cent to applied research and only 1 per cent to basic research.

6. At universities and public institutions of higher education research is mainly basic research. Expenses are paid almost entirely out of the government budget.

7. In 1975 the number of persons with a university degree or an equivalent engineering degree was 85,000 persons, about 3.4 per cent of the total labour force, and the number has increased since then. The total research staff with scientific training corresponded in the same year to about 11,000 persons on a full-time basis.

8. R and D is to a considerable extent carried out independently in private industrial laboratories, by universities or by main research establishments outside the scope of central authorities. Besides, there is no special State budget for science and technology which could be used as an instrument for a central policy. However, some public influence is exerted through a number of research councils each of which is responsible for a specified scientific research field, as well as by a central planning council. These councils can exert some influence in an advisory capacity and via the allocation of budgets for individual areas. Besides, the Parliamentary Research Committee plays a certain role by preparing the Parliament's deliberations of research matters. In recent years and concurrently with the emergence of new structural problems of society and its increasing complexity in general, it has been debated whether and how Danish research should be subject to a more centralized planning and steering than hitherto.

9. Technical assistance and advice from public or semi-public organs in the form of extension services have a long tradition within agriculture, but are also of great importance in the field of manufacturing industries as a supplement to the industries' own endeavours.

10. The major part of the world's industrial technology has been developed and is being utilized, traded and transferred by private companies. Danish private companies seem in some ways especially fit for such transfer.

11. However, certain measures have been taken by the Danish Government to further increase the transfer of technology and technological know-how through the Industrialization Fund for Developing Countries.

12. Some form of transfer of technology is also connected with most Danish aid programmes, whether multilateral or bilateral, e.g. in the form of courses, scholarships, expert assistance or establishment of technical or technological institutions in the countries concerned. Development research and technology directly oriented towards areas of special relevance to the developing countries

is financed by the Ministry of Foreign Affairs within the budgetary framework of a special department (DANIDA) within the Ministry, although, of course, the actual research work is carried out by institutions and persons outside the Ministry. Large contributions have been made under the Danish aid programme to international research institutions.

Main conclusions

13. There seems to be considerable scope for developing and increasing technological co-operation between Denmark, alone or in conjunction with other countries, and the developing countries. Danish governmental institutions as well as private enterprises have clearly shown their interest in this respect.

14. Increased weight should be given to support of the developing countries' own endeavours in the field of science and technology with a view to improving their possibilities of creating viable industries and achieving their economic, social and cultural objectives in general.

15. Special attention should be paid to the development of technologies which will contribute to solving the problems of the poorest population strata in the developing countries. Increased emphasis on development of appropriate technologies, where possible, is an important aspect thereof.

Illustrative examples

16. In Annex I of the paper are mentioned some of the areas ("subject areas") in which Denmark may have particular qualifications for mobilizing science and technology for the benefit of the developing countries. These areas are: Within "Food and Agriculture": (1) Utilization of straw in various fields, e.g. as cellulose in paper production, as straw in the production of article board or as straw as a nutrition. (2) Technological conversion of green-leaves into edible protein-rich foods. The example shows that, by extraction of part of the protein from, e.g., grasses and lucerne before they are fed to animals, the yield of edible protein may be doubled by production of a vegetable protein from the leaves in addition to the animal products produced from the residue. (3) Artificial insemination of cattle. Denmark is among the leading nations in this technique, which implies significant advantages in several respects. Within "Energy": Utilization of solar energy, in which field Denmark in recent years has undertaken extensive experiments especially with respect to house heating and the provision of hot water. However, the same technical devices may be used also for cooling purposes. Within "Health": With its extensive system of health services Denmark has special possibilities of assisting developing countries, in particular in the form of know-how about the organization of health care. The various possibilities and problems in connexion with transfer of Danish knowledge in this field are explained. Within "Housing": Over the last 30 years Denmark has been experimenting with houses lending themselves to simplified construction which, while developed primarily for the communities in Greenland, can successfully be applied in nearly every community in the developing countries. A description of the Danish experience in this field is given. Within "Transport": The construction of numerous small

harbours has given Danish engineers the possibility of experimenting with many different types of solutions and techniques. The developing countries could benefit in many ways from this know-how.

17. Annex II describes the general process of the industrialization with special reference to conditions in the developing countries. Special emphasis is given to the role played by the structure of technological service institutes. The benefits and drawbacks of the Danish approach as far as it is relevant to the developing countries, are briefly described.